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not so quickly nor to such an extent as under normal conditions of contact.

The plants experimented with chiefly were: *Uncaria sclerophylla*, *Ancistrocladus VahlII*, *Roncheria Griffithiana*, *Artrabotrys Blumei*, *Strychnos monospermum*, *S. laurina*, *Amphilobium mutsii*, *Bauhinia tomentosa*, *Dalbergia lingua*, and *Vanilla aromatica*.

H. M. R.

**Apogamy in Ferns.**<sup>1</sup>—A considerable series of cultures under varying conditions show that some, at least, of the conditions which induce apogamic development in fern prothalli are a deprivation of water sufficient to prevent the possibility of fertilization and the action of direct sunlight. Different degrees of apogamy are possible, from a cylindrical process still bearing sexual organs arising from the apex of the prothallus, to the condition where this process gives rise directly to the vegetative bud of the sporophyte.

While the authors admit that, with certain assumptions, the theory of antithetic alternation, as advanced by Bower, affords a satisfactory explanation of the relation of the gametophyte to the sporophyte generation, they are inclined to favor more the idea of homologous alternation, namely, that the sporophyte arose gradually from modifications of individuals resembling the sexual plant, and is not from a mere elaboration of the zygote. The line of evidence offered bears on the assuming of a terrestrial habitat by originally aquatic plants, whereby these plants, in adapting themselves to dryer surroundings, are forced to develop in the line of the production of dry reproductive cells (spores) rather than the more sensitive sexual organs. Hence the increase in size and importance of the spore-bearing plant, which eventually, by its own mass of vegetation, would afford shade, and consequently the conditions more suitable for the persistence of the primitive moisture-loving sexual stage.

The authors conclude by saying that the question is still an open one and must remain so until more decisive evidence is brought forward by which either the theory of homologous alternation or that of antithetic alternation can be shown to be untenable.

H. M. R.

#### **A New Method for Preserving and Fixing Fresh-water Algæ.<sup>2</sup>**

—This fixing agent consists of equal volumes of formalin, pyrolignic acid, and methyl alcohol. The algæ are drained as far as is possible, without injury to them, from the water in which they grow, and

<sup>1</sup> Lang, W. H., and Clark, G. H. On Apogamy and the Development of Sporangia upon Fern Prothalli, *Bot. Centralblatt*, Bd. lxxiv, Nr. 3, p. 72.

<sup>2</sup> Pfeiffer, Oesterreicher. *Bot. Zeit.*, Bd. xlviii, Hefte 2 und 3, 1898.